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ABSTRACT

Commercial achievement tests often provide limited instructional guidance and seldom provide feedback specific to any given classroom. The most instructionally relevant achievement tests are those developed by an individual teacher for use with a particular class. This digest describes the steps of test construction and presents suggestions for interpreting the outcomes of the achievement tests. The first steps involve identifying what the students should have learned and designing the test. The learning objectives emphasized determine the material to include and the form the test will take. Once the objectives have been designed, the second step--writing the questions--can be attempted. General principles of test construction are reviewed. Guidelines for construction of multiple-choice tests, probably the most difficult to construct, are also given. The third step is a final check and review of the finished test. Considering the questions related to the various learning objectives as separate subtests can help the teacher develop a profile of each student's knowledge of the objectives. A carefully constructed achievement test can help the educator teach more effectively and the student master more of the objectives. (SLD)

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Constructing Classroom Achievement Tests

by Ruth Axman Childs, ERIC/TM

Achievement tests are well suited to provide educators with objective feedback as to how much students are learning and understanding. Commercially published achievement tests, if used carefully, can provide not only evaluations of the knowledge levels of individual students, but also information about how those students compare with students in other schools. While assessing a wide range of skills, however, commercial achievement tests often provide only limited instructional guidance. They seldom provide feedback on the mastery or non-mastery of the full range of specific skills taught in any given classroom.

The most instructionally-relevant achievement tests are those developed by the individual teacher for use with a particular class. Teachers can tailor tests to emphasize the information they consider important and to match the ability levels of their students. If carefully constructed, classroom achievement tests can provide teachers with accurate and useful information about the knowledge retained by their students.

This digest is meant for classroom teachers. It describes the steps of test construction--designing the test, writing the questions, and checking the test for construction problems. It also presents suggestions for interpreting the outcomes of achievement tests.

Step 1. Designing the Test

The first step in constructing an effective achievement test is to identify what you want students to learn from a unit of instruction. Consider the relative importance of the objectives and include more questions about the most important learning objectives. If, however, the test focuses on a few objectives to the exclusion of others, students will not have the opportunity to demonstrate their understanding of other aspects of the material and you may not be able to make an accurate assessment of each student's knowledge.

The learning objectives that you want to emphasize will determine not only what material to include on the test, but also the specific form the test will take. For example, if it is important that students be able to do long division problems rapidly, consider giving a speeded test. The types of questions to be used will also depend on the learning objectives. If it is important for students to understand how historical events affected one another, then short answer or essay questions might be appropriate. If it is important that students remember dates, then multiple-choice or fill-in-the-blank questions might be appropriate.

Step 2. Writing the Questions

Once you have defined the important learning objectives and have, in the light of these objectives, determined which types of questions and what form of test to use, you are ready to begin the second step in constructing an effective achievement test. This step is writing the questions.

General Principles

While the different types of questions--multiple choice, fill-in-the-blank or short answer, true-false, matching, and essay--are constructed differently, the following principles apply to constructing questions and tests in general.

1. Make the instructions for each type of question simple and brief.
2. Use simple and clear language in the questions. If the language is difficult, students who understand the material but who do not have strong language skills may find it difficult to demonstrate their knowledge. If the language is ambiguous, even a student with strong language skills may answer incorrectly if his or her interpretation of the question differs from the instructor's intended meaning.

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3. Write items that require specific understanding or ability developed in that course, not just general intelligence or test-wiseness.

4. Do not suggest the answer to one question in the body of another question. This makes the test less useful, as the test-wise student will have an advantage over the student who has an equal grasp of the material, but who has less skill at taking tests.

5. Do not write questions in the negative. If you must use negatives, highlight them, as they may mislead students into answering incorrectly.

6. Specify the units and precision of answers. For example, will you accept numerical answers that are rounded to the nearest integer?

Multiple Choice Questions

The most commonly used type of question is the multiple-choice question. Multiple-choice questions are more easily and objectively graded than essay questions and are more difficult to answer correctly without the required knowledge than true-false questions. Multiple-choice questions, however, are probably the most difficult type of question to construct. The following are a few guidelines for multiple-choice question construction.

1. State clearly in the instructions whether you require the correct answer or the best answer to each item.

2. Instead of repeating words in each alternative, include these words in the main body of the question. This will make the question easier to read and the options easier to compare. The grammar or structure of the main part of the question must not contain clues to the correct response, however.

3. Make incorrect alternatives attractive to students who have not achieved the targeted learning objectives.

4. Vary randomly the placement of correct responses.

5. Make all choices exactly parallel. Novice test writers tend to make the correct answer longer and more carefully worded and, by doing so, may provide a clue to the correct answer.

6. Never offer "all of the above" or "none of the above" as an alternative in a best-response multiple-choice question. Whether "none of the above" is chosen as a better response than one of the other options may depend on what evidence the student considers rather than how well he or she understands the material.

7. Control the difficulty of a question by making the alternatives more or less similar or by making the main part of the question more or less specific. If the alternatives are more similar, the student will have to make finer distinctions among them. If the main part is more specific, the student will be required to draw on more detailed knowledge.

Step 3. Final Check

Finally, review the test. Are the instructions straightforward? Are the selected learning objectives represented in appropriate proportions? Are the questions carefully and clearly worded? Special care must be taken not to provide clues to the test-wise student. Poorly constructed questions may actually measure not knowledge, but test-taking ability. For example, if two options on a multiple choice question are redundant, a test-wise student will realize that neither can be the correct answer. By eliminating two choices the student increases his or her chances of answering the question correctly.

Interpreting the Test Results

If you have carefully constructed an achievement test using the above principles, you can be confident that the test will provide useful information about the students' knowledge of the learning objectives. Considering the questions relating to the various learning objectives as separate subtests, you can develop a profile of each student's knowledge of or skill in the objectives. The scores of the subtests can be a useful supplement to the overall test score, as they can help you identify specific areas which may need attention. A carefully-constructed achievement test can, by helping you know what your students are learning, help you to teach more effectively and, ultimately, help the students to master more of the objectives.

Further Resources:

Brown, Frederick G. *Principles of Educational and Psychological Testing*. New York: Holt, Rinehart and Winston, 1983.

Ebel, Robert L. *Essentials of Educational Measurement*. Englewood Cliffs, NJ: Prentice-Hall, Inc., 1972.

Gronlund, Norman E. *Constructing Achievement Tests*. Englewood Cliffs, NJ: Prentice-Hall, Inc., 1968.

Nunnally, Jum C. *Educational Measurement and Evaluation*. New York: McGraw-Hill Book Company, 1964.

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